IOL332 Controller

LonWorks® Door controller

User's Manual

Vers.:	Date:	Note:
1.0	January 2003	English version
1.1	August 2003	Change connection for Wiegand reader
1.2	April 2006	Integration for the PX10T reader
1.3	December 2006	A note is added for the RJ45 connector reader

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1. INTRODUCTION

The IOL332 is a LONWORKS® based node, designed to control one or two protected gates in the Globe2000 Access Control System.

Two HW versions are available:
- Standard version: 12VDC ±20% power supply
- Enhanced version: 12/24VAC – 15/36VDC power supply.

The Node IOL332 can manage two different card readers: magnetic or proximity, that can be used to implement an access procedure based on user's identification. Two different application allow to manage from the reader *ISO clock+data* or *wiegand* data output

The Node IOL332 includes 3(three) On/Off Inputs:
- to sense the door status (open or closed)
- to acquire commands from a pushbutton to unlock the gate.
- one input is exclusive to tamper protection.

It includes also 3(three) relay outputs that can be used to drive:
- elecric locks
- automatic doors or gates
- local alarm device

Besides,it includes 4(four) outputs to drive LEDs and/or buzzers embedded in the card readers, which are automatically driven by the node, to signal a granted or not granted access and the door/gate status.

The node IOL332 communicates to the LONWORKS® network through the FTT10 transceiver at 78,1 kbps.

The node IOL332 has got an on-board memory to store a local list up to 100 enabled card codes. This list allow to build a simple access control without using any other devices like database controller. The local list can be also used in case of failure of database manager

Some network variables allow to communicate the following events:

- No transit after card recognition
- Door left open
- Unauthorized transit
- Tamper alarm

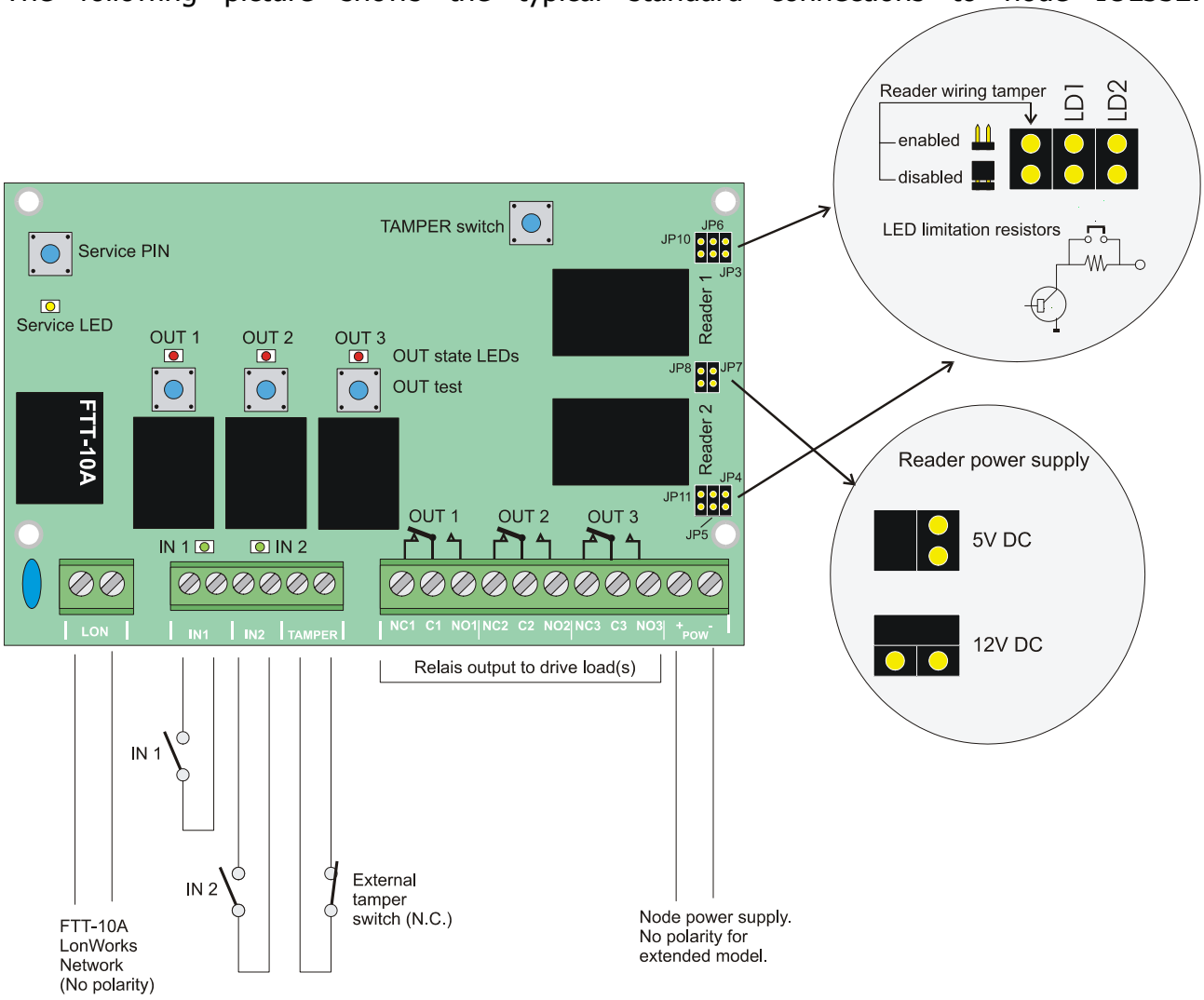
2.TECHNICAL SPECIFICATIONS

Power supply	Standard: 12 VDC ±20% Enhanced: 12-24 VAC or 15-36VDC
Power consumption	35 mA @ 12 V, 150 mA max.with Relays and LED activated
Inputs	2 General Purpose ON/OFF Inputs 1 Tamper Input
Outputs	3 Relay Outputs, with NO contact protected with VDR 47 V 4 NPN OC Outputs whith optional limitation resistor
Card reader inputs	2 inputs at TTL level to interface ISO clock+data or Wiegand data format
Card readers power supply	5VDC or 12VDC selectable, protected against short circuit.
Tamper	BOX opening, Readers wiring and external Input.
Transceiver	LonWorks® FTT-10 78,1 Kb/s
Processor	Neuron Chip 3150
Clock frequency	10 MHz
Service Interface	Service pin or manual entry – service led on board
Operating Temp.	0 – 50° C
Relative Humidity	20 – 80%
Mechanical Structure	Plastic Box
	Wall mounted or panel mount
Mechanical Size	140 x 125 x 30 mm
Application Program	IOL3M01T (Clock+data) IOL3M01W (Wiegand)
Program ID	90:0A:0E:00:01:00:22:00
XIF & NXE files	Iol3m01.xif iol3m01T.nxe (Clock+data) iol3m01W.nxe (Wiegand)
NV Count	59
Alias Count	21
Plug-in	Available on LNS3 Platform

3. INSTALLATION

It is strongly recommended to install the IOL332 equipment in the protected and safe location.The equipment could be hided over a floating ceiling or mounted inside a closed box nearby, to prevent sabotage on the door's electric lock contacts.

The following picture shows the typical standard connections to node IOL332.



4.IOL332 HW DESCRIPTION

4.1 IN1/IN2 Inputs

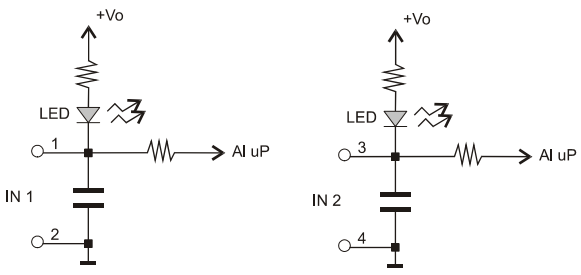
IN1 and IN2 inputs are suitable to interface clear contact switches. Each input owns a green LED as status indicator. The LED will be lighted when the related input is closed. IOL332 leaves a complete freedom regarding the HW signal to be connected to the input. The logical assignment between the physical input and the related functionality will be done throught binding during the SW configuration. Each input can be used to interface:

- Door or gate state switch (normally closed, when the door is closed).
- Pushbutton,to open manually the door or the gate.
- Others clear contact switches for any general purpose.

It is possible to have the maximum freedom in cabling inputs,but we recommend to keep the same connection diagram when wiring similar IOL332 in a single project, in order to simplify configuration and maintenance.

Each input is managed by an open/close loop sensor LONMARK® object, as explained in the relative session.

The inputs will not work if no readers power supply is selected using JP7 and JP8 jumpers.



IN1 and IN2 simplified schematic diagram

4.2 Tamper Input

The special TAMPER input is suitable to interface a normally closed clear contact switch. When this input is not used, it must be kept closed using a wire jumper. The short-circuit wire jumper is included in the delivered IOL332 node. Tamper controls:

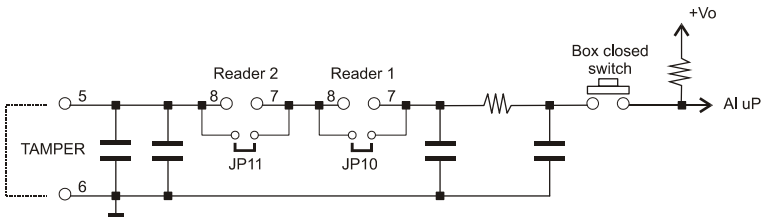
- The box cover closing, using the particular spring switch.
- The reader 1 wiring.
- The reader 2 wiring.
- The external tamper input.

When one of these conditions fail, a tamper alarm is generated, as explained in the session related to the tamper LONMARK® object.

The spring switch to detect the box cover opening cannot be disabled. Always, when the box is open, the tamper alarm will be generated.

Wires 7 and 8 are used to detect a reader disconnection from the node. These wires usually must be kept short-circuit together. When the connection between wire 7 and 8 is cut, a tamper alarm will be generated. The reader wiring protection can be disabled jumpering the JP10 regarding the reader 1 and JP11 regarding the reader 2. Remember to keep the JP10 or JP12 closed, when the related reader is not used.

The available tamper input can be used to interface an external switch when IOL332 is mounted in a larger box containing other devices, to be protected against sabotage.



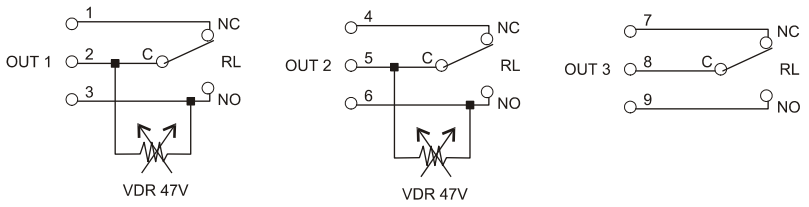
TAMPER simplified schematic diagram

4.3 Relay Outputs

The IOL332 includes three relay outputs. OUT1 and OUT2 are equipped with 47V, suppressor in parallel to the normally open contacts. This is performed to use these outputs to drive highly inductive load as an electric lock coil. Regarding the SW functionality, the three outputs are completely equivalent.

A red LED status indicator is light when the relay is activated. The three pushbuttons, one for each outputs, allow to test the node outputs cabling, just pressing them.

The max. allowable load in output contact is 1A, with 48V max.



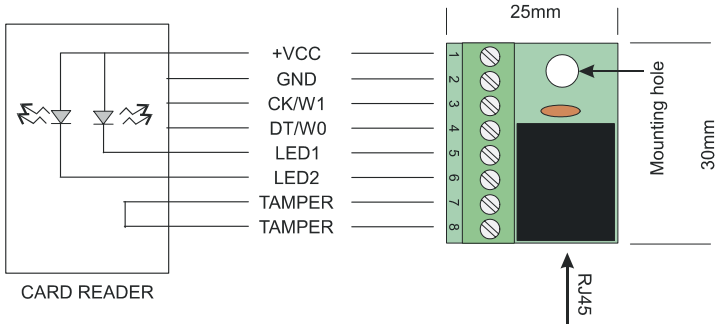
Relay outputs simplified schematic diagram

4.4 Reader Connectors

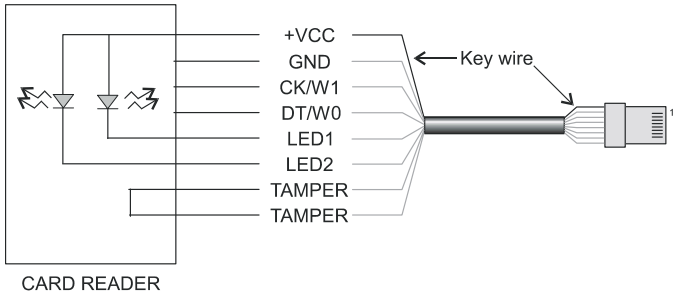
There are two RJ45 connector each one includes 8 PIN, to interface two card readers with the following pin-out:

PIN #	Signal description
1	+VCC reader power supply. 5VDC or 12VDC selectable. Short circuit protection
2	GND reader power supply and common signal reference
3	CLOCK signal for ISO interface or Wiegand 0
4	DATA signal for ISO interface or Wiegand 1
5	LD1 output – Usually green LED driving
6	LD2 output – Usually red LED or buzzer driving
7	Tamper
8	Tamper

To easily interface a reader with IOL332, we suggest to use the PL8M board, which has got an RJ45 and screw connectors,each one of them include 8 PIN.



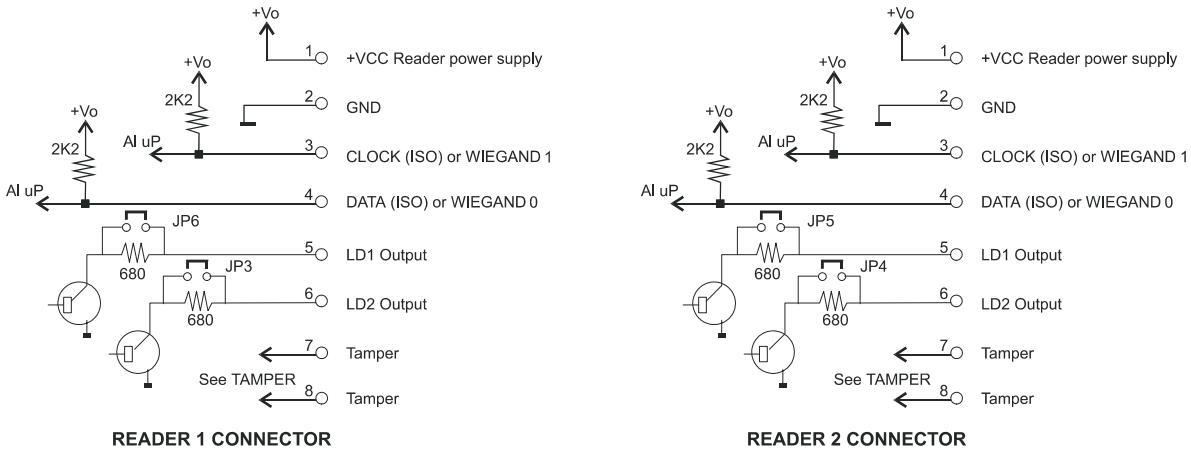
Card reader connection using the PL8M board



Card reader connection using direct wiring

Note: the IOL332 doesn't manage the Card Present signal and doesn't drive the buzzer could come from the reader; in this case these two wire haven't to be connected.

The picture shows the correct connection between the node and the readers. A junction box which includes PL8M could be installed near the card reader. Junction box is connected to IOL332 thought a 8 wire patch cord using two RJ45 connector. The card reader is connected to the PL8M screw terminal, in order to simplify cabling and further maintenance operations.



Reader connectors simplified schematic diagram

Be careful to insert the 680 ohms limitation resistor when driving LED directly with LD1 and/or LD2 outputs. To insert the limitation resistor, the related jumper must be kept open.

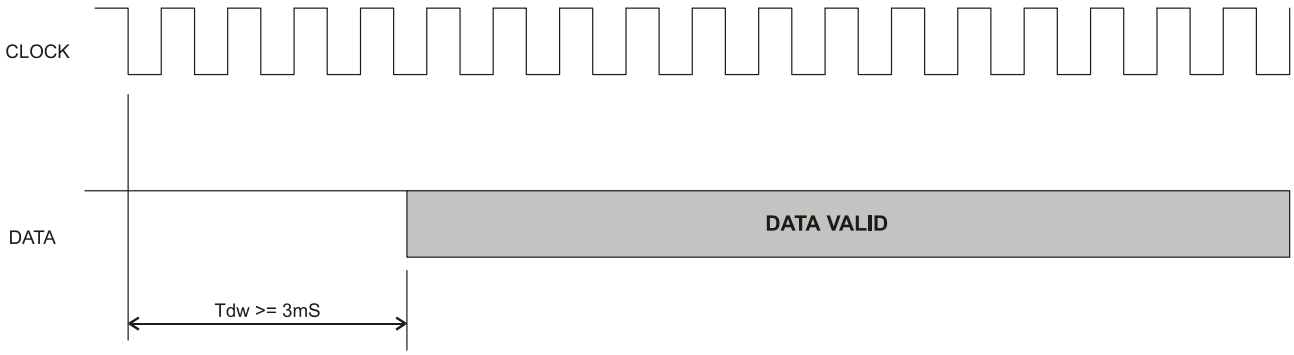
LD1 and LD2 output can be set, to drive 3(three) different HW configurations:

- One LED
- Two LEDs
- One LED + One Buzzer

These outputs can be used to monitor the door state too. More details about configuration will be given in the "Reader Object" chapter.

4.5 ISO TTL Data+Clock Interface

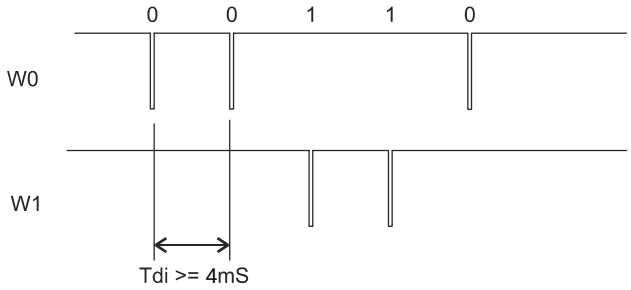
This interface is the more used with magnetic card reader. It consists of two signal lines, the clock and the data. During the clock failing edge, the data is valid. To be managed by IOL332, the clock signal must become active at least 3ms before starting valid data, as represented in the diagram below. This is not a problem for standard magnetic card reader, because magnetic card encoding is according to this requirement. Be careful, when interfacing a device with *ISO data+clock* output emulation. The Card Present signal (CP), required in the APICE IOL222 node, is not necessary in IOL332. No external diodes or resistor are required.



Clock + Data ISO interface recommended timing

4.6 Wiegand Interface

This interface consists of two signal, the logic level 0 and the logic level 1. Usually both lines are to logic level 1. When one line goes to level "0" and returns to level "1" the related logic level is transmitted. Only one line at time can transmit one data pulse.In order to interface a device with the IOL332, the distance between the data pulses must be 4ms or greater, as shown in the following picture:



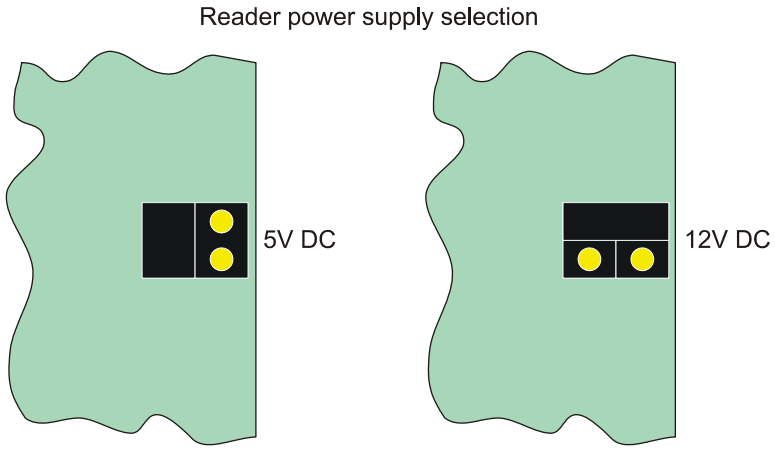
Wiegand interface recommended timing

4.7 Selecting ISO clock+data or Wiegand Interface

No HW operation is required to select, *ISO clock+data* or *wiegand* interface. The difference is in application loaded into the node. One application manages two *ISO clock+data* card reader, the other application manages *wiegand* interface. It is not possible, to use one reader with *ISO clock+data* interface and the other with *wiegand* interface. Please,refer to the application list. The node application can be changed downloading it into the node throught FTT-10 LonWorks® network.

4.8 Card Readers Power Supply

Card readers power supply can be 5Vdc or 12Vdc selectable. Both readers must work with the same voltage, or 5Vdc or 12Vdc . The card readers power supply is protected against short-circuit. After the short-circuit protection intervention, to reset it is necessary to remove the cause and power off the node. The same power supply is used to power the inputs IN1, IN2 and TAMPER, too. Power supply selection is performed using JP7 and JP8 jumpers. Jumpering JP7 and JP8 in wrong position will cause no damage to the IOL332 board, but the equipment could not properly work. Apice S.r.l. will be not responsible for any damage caused by improper jumper setting.



Card reader power supply jumper selection

4.9 IOL332 Power Supply

Two different models are available:

- IOL332 with 12Vdc ±20%
- IOL332 with 15 to 36VDC or with 12 to 24VAC.

The extended power supply model has one additional DC/DC converter mounted directly on PC board. The ± polarity must be respected in 12VDC power supply model. The extended power supply model is polarity insensitive.

It is recommended to use a different power supply line from IOL332 line, to power electric lock coils or other power devices. Don't exceed 300mt power supply cable length and use the appropriate cable section, to guarantee the minimum power supply to the node even if in max. load conditions.

The 12VDC power supply model can be easily connected to a 12V battery back-up power supply system.

4.10 Network Connection

We recommend to follow Echelon® guidelines to cable LonWorks® network. IOL332 works using FTT-10A, free topology 78,1Kb network interface. The Network is polarity insensitive.

4.11 Service Pin and ervice LED

The IOL332 node is provided with service pin pushbutton and service LED. The pushbutton is used, to send to an installation or diagnostic tool the unique node Neuron-Id. The service LED is useful to discovery the node state.

Service LED	Node state
Flash at power ON, then OFF	*Configured*. The node is installed in one network
1s OFF at power ON, then ON	*Applicationless*. The node has not application
Blinking at 1s period	*Unconfigured*. The node must be installed in one network
Always ON	*Damaged*
Always OFF	*Damaged*

The IOL332 node is delivered in the *Unconfigured* state. The application will not run until the node will be installed in one network using the opportune SW tool. We recommend to use Echelon® LNS3 based installation tool.

5. IOL332 APPLICATON GUIDELINE

5.1 LONMARK® Objects List

IOL332 contains 18 LONMARK® objects as listed below:

- 1 Node object
  - Obj0: Node object type 0
- 2 open/close loop sensor related to IN1 and IN2
  - Obj 1: DsInput[0] type 3:20005 physical input 1
  - Obj 2: DsInput[1] type 3:20005 physical input 2
- 3 close loop actuator related to relay outputs.
  - Obj 3: DsOutput[0] type 3:20006 physical output 1
  - Obj 4: DsOutput[1] type 3:20006 physical output 2
  - Obj 5: DsOutput[2] type 3:20006 physical output 3
- 2 reader objects related to the card reader inputs
  - Obj6: Reader[0] type 3:20008 physical reader input 1
  - Obj7: Reader[1] type 3:20008 physical reader input 2
- 1 open loop sensor related to TAMPER input
  - Obj8: DsTamper type 3:20009 physical tamper protection
- 1 open loop sensor not used in this release
  - Obj9: DsVoltage type 3:20009 not used
- 2 SNVT_lev_disc to SNVT_switch converter
  - Obj10: LevDisc2Switch[0] type 3:20002 no hardware dependences
  - Obj11: LevDisc2Switch[1] type 3:20002 no hardware dependences
- 2 SNVT_switch to SNVT_lev_disc converter
  - Obj12: Switch2LevDisc[0] type 3:20003 no hardware dependences
  - Obj13: Switch2LevDisc[1] type 3:20003 no hardware dependences
- 2 door objects to handle the gate control
  - Obj14: Door[0] type 3:20009 no hardware dependences
  - Obj15: Door[1] type 3:20009 no hardware dependences
- 1 Logic functions object
  - Obj16: SLogics type 3:20010 no hardware dependences
- 1 User list object
  - Obj17: UserList type 3:20012 configurable reader dependence

The present data sheet describe each object kind listed above. Each functional object can contains configuration property which are using direct access read/write according to LONMARK® interoperability guideline V 3.1. In order to properly configure the node, it is suggested to use LONWORKS® installation tool LNS3 based. APICE provides a plug-in, using LNS3 server, to easily configure the node.

IMPORTANT INFORMATION	We recommend to install in the equipment, APICE resource files greater than or equal to version 1.9 before starting any project using IOL332 node, in order to load the right configuration types. APICE resource files are according with LONMARK® specification. To load resource file under LNS use the Echelon® LNS Resource File Catalog Utility.

Conventions in the present user manual

NV: = Network variable
NVI: = Input network variable
NVO: = Output network variable
CP: = Configuration property

SNVT_switch

This node application use **SNVT_switch** *NV* type to manage ON/OFF signal. When we refer to ON and OFF value for this type of *NV* we assume that:

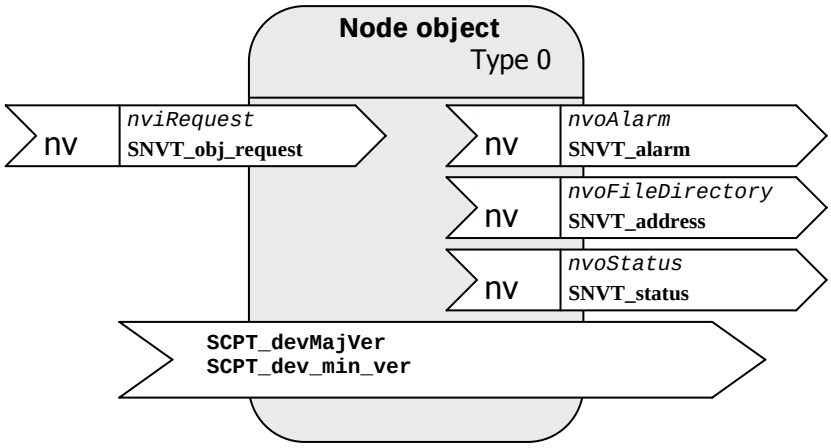
The *NVI* ignores the value field, only the state field is used and it is interpreted as:

- OFF when state field is 0
- ON when state field is greather than 0

The *NVO* drives both state and value fields in *NV* as:

- OFF value is sent out as value = 0,0 and state = 0
- ON value is sent out as value = 100,0 and state = 1

5.2 Node Object



nviRequest SNVT_obj_request

This *NV* allow to manage all functional object included in the node as LONMARK® specification required. Supported action for each objects are:

Objects	Req Mask	Normal	Enable	Disable	Alarm notify enable	Alarm notify disable	Clear alarm
IN1 – IN2	X	X	X	X	X	X	X
TAMPER	X	X	X	X	X	X	X
VOLTAGE	X	X	X	X	X	X	X
OUT1..3	X	X	X	X	X	X	X
READERS	X	X	X	X	X	X	X
DOORS	X	X	X	X	X	X	X
CONVERTERS	X	X	X	X			
LOGIC	X	X	X	X			
USER LIST	X	X	X	X			

nvoStatus SNVT_obj_status

This *NV* send out the requested object statut when a request is launched.

nvoFileDirectory SNVT_address

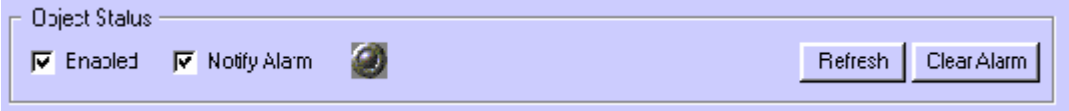
This *NV* is used to configuration properties direct read/write access.

nvoAlarm SNVT_alarm

This *NV* send out the object's alarm state when it occurs. The object's alarm state remains active until a CLEAR_ALARM request is sent to the object. The *nvoAlarm NV* value reflect the last alarm event in the node. When a CLEAR_ALARM is launched to an object, the *nvoAlarm NV* is updated with the new alarm state. The ALRM_NO_CONDITION is sent out only if the alarm cause is dropped, otherwise a new alarm condition is updated. More details about alarm are described in the chapters related to each object.

Important notice about nvoAlarm and nviRequest

In the previous version the object's alarm status sent out from *nvoAlarm NV* has not been completely tested. Also the object managed by *nviRequest* will be completely tested in the next release. Some plug-in windows have in the top the management of the object 0 as show in the followed picture.



The working of this frame has not been documented in the present user manual because it is related with the full implementation and testing of alarm and object request features. Please note this frame is operative, un-checking the enable box means disable the object. In case of accidental setting in this frame, the object will restore the default setting just resetting the device.

SCPT_dev_maj_ver, SCPT_dev_min_ver

These configuration properties are read only an cannot be changed. They are useful to know the application version.

Remarks: The *SCPT_dev_min_ver* contains important information regarding the *ISO clock+data* or *wiegand* reader input IOL332 capability.

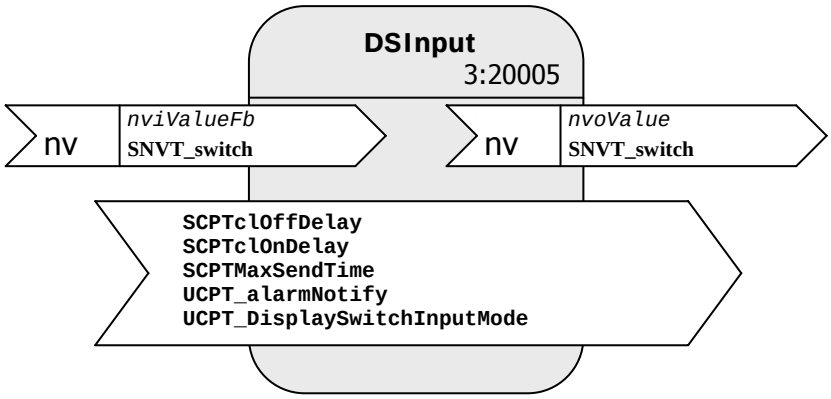
- Even version numbers (0, 2, 4…) identifies *ISO clock+data interface*
- Odd version numbers (1, 3, 5…) identifies *Wiegand* interface

In this manner the IOL332 will keep the same network interface and program ID in both reader interface mode. We remember that two different applications are available for each reader interface.

Available IOL332 files:

- Iol3m01.xif — It is the same for both reader interfaces.
- iol3m01T.nxe — Application image *ISO clock+data* interface.
- iol3m01W.nxe — Application image *wiegand* interface.

5.3 Open/Close Loop Sensor(IN1 and IN2)



Both physical input 1 and Input 2 are managed by an open/close loop sensor object. The selection between open and close loop functionality is automatically performed depending from *nviValueFb* binding:

- When *nviValueFb* is not bound, the object work as an open loop sensor.
- When *nviValueFb* is bound, the object work as a close loop sensor.

nviValueFb SNVT_switch

This *NV* is the feedback input value used in close loop sensor functionality only. It is complied with LONMARK® directive.

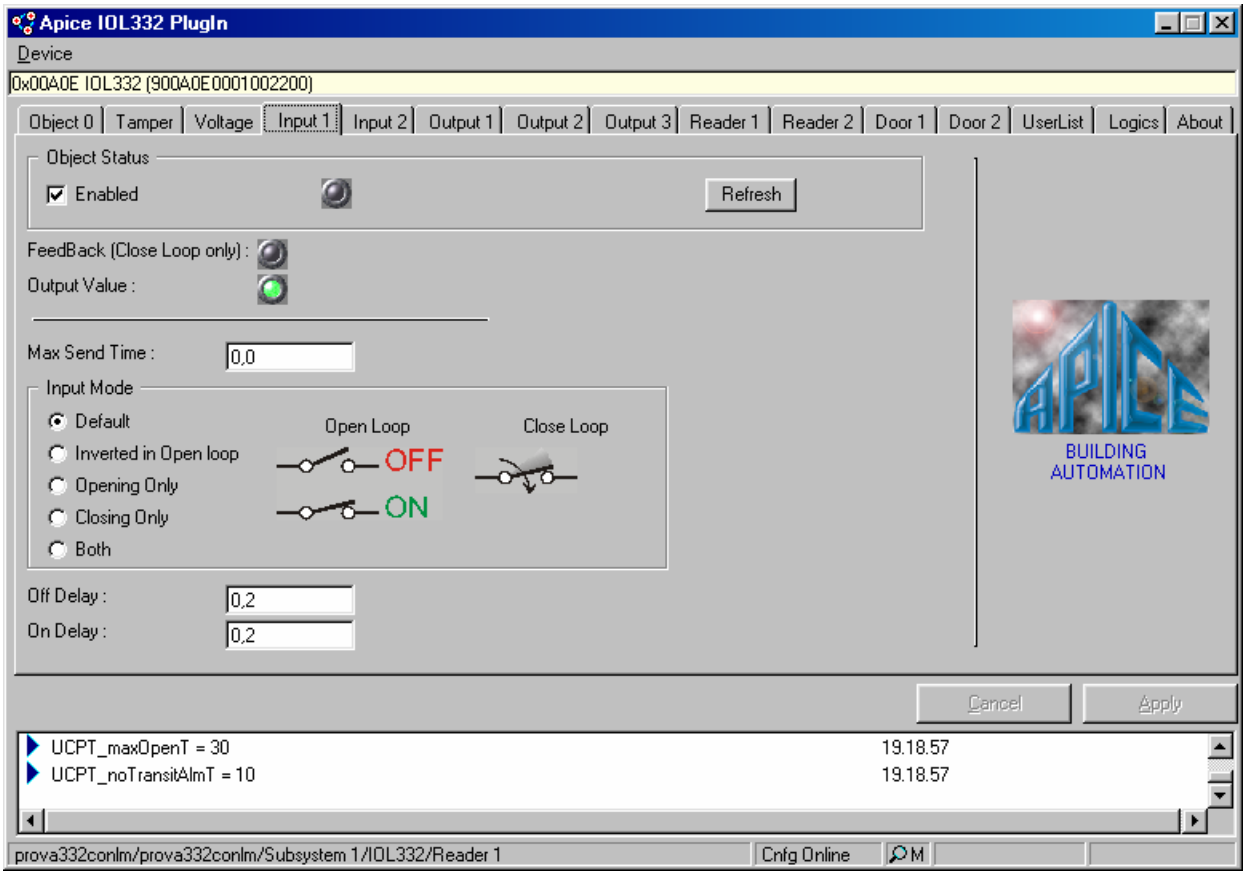
nvoValue type SNVT_switch

This is the main *NV* in the object. Object's configuration properties affects the *NV* value behavior as explained below.

Input 1 and input 2 are not default related with any door functionality. The *nvoValue NV* must be bound to the controller or actuator object to obtain the desiderated effect.
These inputs could be used to control the door state, to open the door, etc…

Configuring inputs using plug-in

The input configuration window in APICE IOL332 plug-in is showed below:



FeedBack (Close loop only)

This is the *nviValueFb* value monitored on the network. Even if this is an input network variable, the plug-in doesn't allow to change its value. It is showed for monitor purpose only.

- Dark LED = OFF
- Green LED = ON

Output Value:

This is the *nvoValue* monitored on the network. This is a read only value because the network variable has output direction.

- Dark LED = OFF
- Green LED = ON

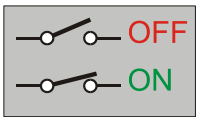
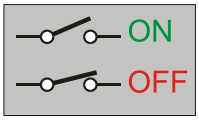
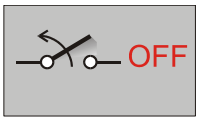
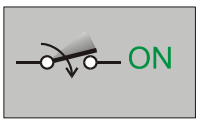
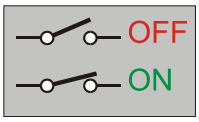
Max Send Time

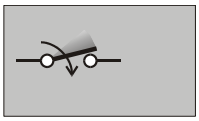
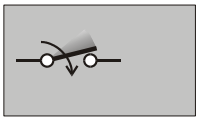
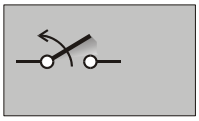
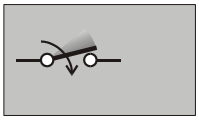
This parameter affect the *SCPT_maxSendTime* configuration property. The **Max Send Time** value is ignored when the object works like close loop mode because it could cause problems when multiple sensor objects are bounded to a single actuator. When **Max**

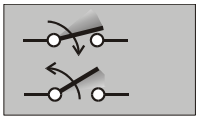
Send Time is set with a value greather than 0, the *nvoValue* is propagated on network at least each **Max Send Time** seconds.

Input Mode

This parameters affect **the UCPT_DisplaySwitchInputMode** configutation properties. It can assume 5 different values. Depending the object is working in open loop or in close loop mode, the Input mode can assume different means.

open loop mode		
Value	**Icon**	**Description**
Default		Opened input = OFF value Closed input = ON value
Inverted in open loop		Opened input = ON value Closed input = OFF value
Opening only		Only the OFF value is propagated when the input is opening.
Closing only		Only the ON value is propagated when the input is closing.
Both		Same as *Default*

close loop mode		
Value	**Icon**	**Description**
Default		*nvoValue* will change (reversing the *nviValueFb* value) when the input will change from opened to closed status.
Inverted in open loop		Same as *Default*
Opening only		*nvoValue* will change (reversing the *nviValueFb* value) when the input will change from closed to opened status.
Closing only		Same as *Default*

Both		*nvoValue* will change (reversing the nviValueFb value) when the input will change anyway.

ON Delay

This parameter affect the *SCPTclOnDelay* configuration parameter.

In open loop working mode:

This is the delay between the moment where one input change event generate an ON value (see **Input Mode**) and when the ON value is propagated to the output network variable. The physical input must remains in this state during all **On Delay** time otherwise the operation will be interrupted and the value will be not propagated.

In close loop working mode:

This is the delay between the moment where one allowable input change event is detected (see **Input Mode**) and when the ON value must be propagated to the output network variable (because the feedback input value is OFF). The physical input must remains in this state during all **On Delay** time to accept the current input change event.

OFF Delay

This parameter affect the *SCPTclOffDelay* configuration parameter.

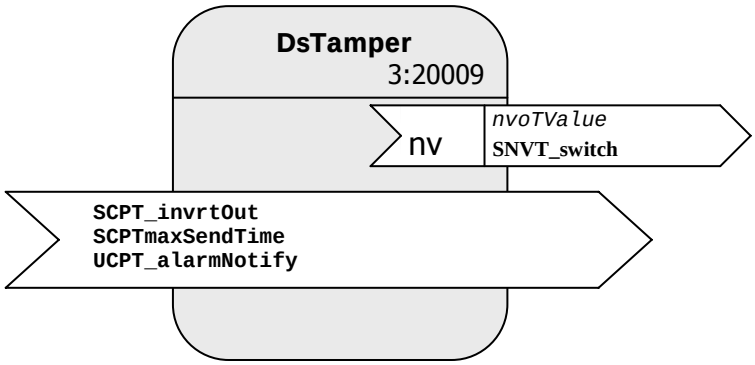
In open loop working mode:

This is the delay between the moment where one input change event generate an OFF value (see **Input Mode**) and when the OFF value is propagated to the output network variable. The physical input must remains in this state during all **Off Delay** time otherwise the operation will be interrupted and the value will be not propagated.

In close loop working mode:

This is the delay between the moment where one allowable input change event is detected (see **Input Mode**) and when the OFF value must be propagated to the output network variable (because the feedback input value is ON). The physical input must remains in this state during all **Off Delay** time to accept the current input change event.

5.4 Open Loop Sensor(Tamper)



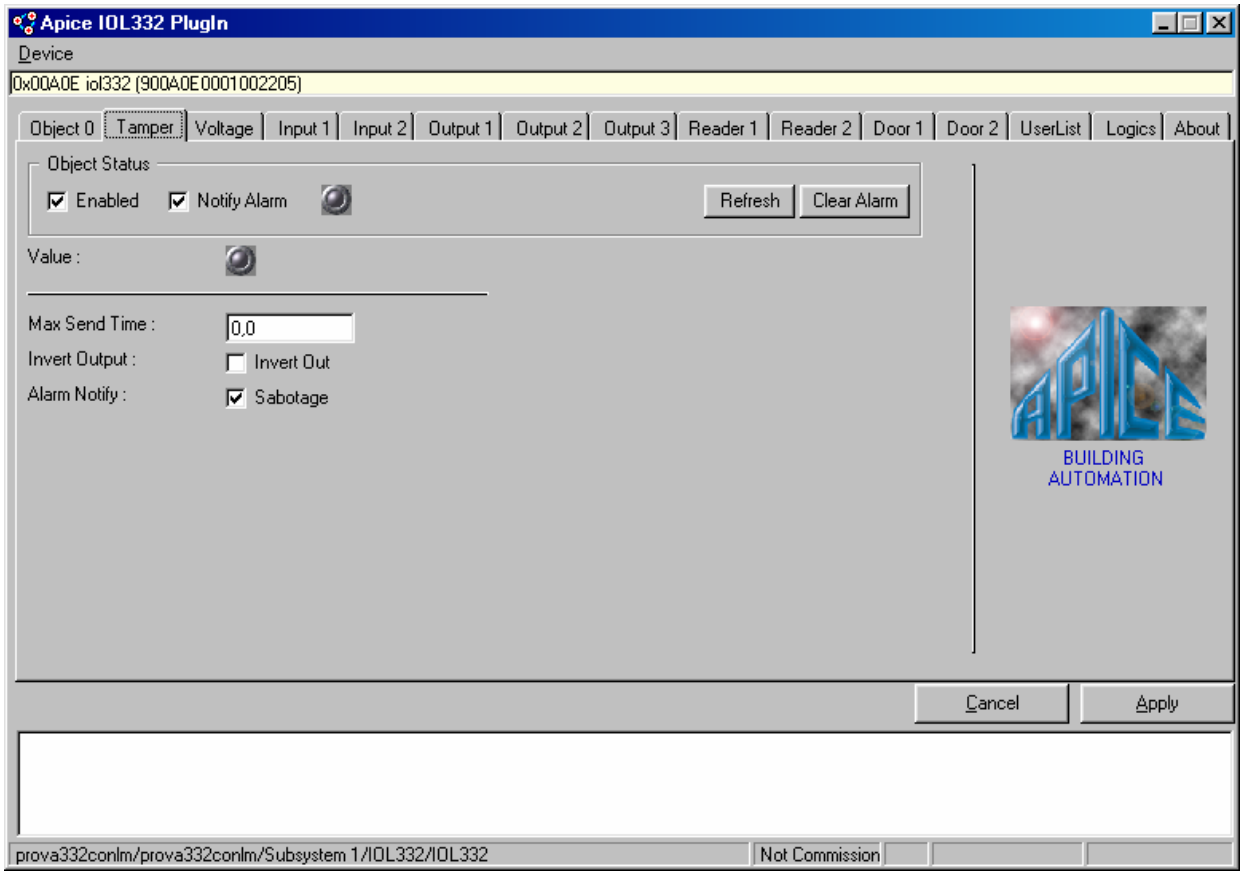
This object controls the tamper circuit in IOL332. It works like an open loop sensor, sending out in *NV nvoTValue* the tamper state.

nvoTValue SNVT_switch

This *NVO* reflect the hardware tamper state. When it is not reversed, the *NV* assume an OFF value when the tamper circuit is closed and ON value when the tamper circuit is opened.

Configuring using plug-in

The tamper configuration window is showed below:



Value

This indicator monitor the *nvoTValue NV* value.

- Dark LED = OFF
- Red LED = ON

Max Send Time

Correspond to *SCPTmaxSendTime CP*. When it has a value greater than 0, the *NVO* is propagated at maximum each **Max Send Time** seconds in according with LONMARK® directives.

Invert output

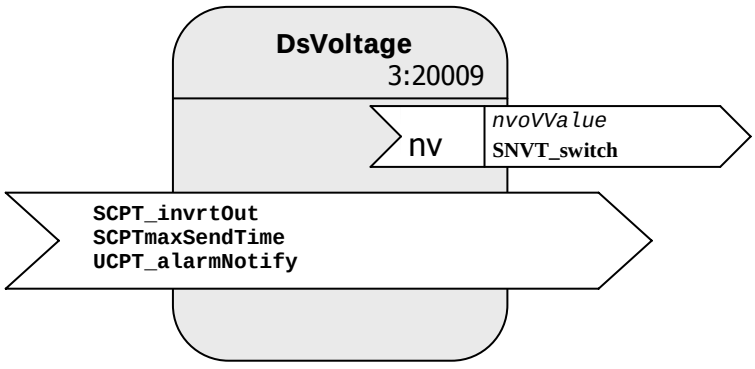
Correspond to *SCPT_invrtOut CP*. When the box is unchecked the *CP* value is ST_OFF, when checked the *CP* value is ST_ON. This affect the *NVO* behavior as showed in the followed table:

SCPT_invrtOut	Tamper closed	Tamper opened (alarm)
ST_OFF (unchecked)	OFF	ON
ST_ON (checked)	ON	OF

Alarm notify

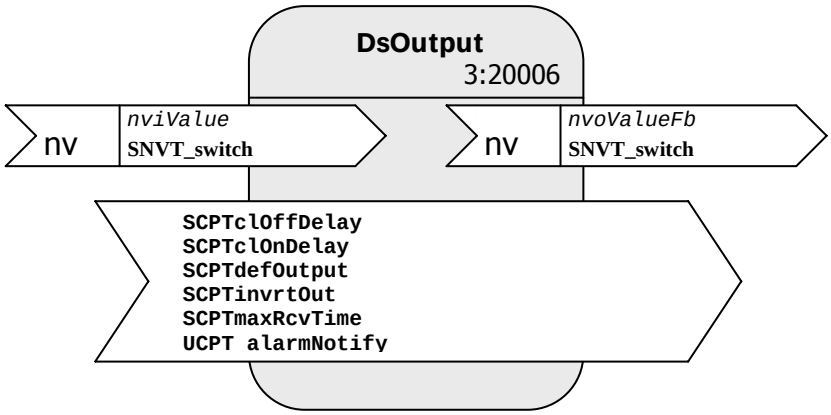
Correspond to *UCPT_alarmNotify CP*. When the box is checked, the tamper alarm is sent out thought the object 0 *nvoAlarm*. When the box is unchecked, the alarm is not sent out. The alarm state ignore the invert output setting. The alarm is sent out when the tamper circuit is opened.

5.5 Open Loop Sensor(Voltage)



The object functionality is not implemented in this release.

5.6 Close Loop Actuator(Relay Outputs)



Each relay output is driven by one close loop actuator object, which can work as open loop actuator too. In this case the *nvoValueFb* will be not used.

nviValue

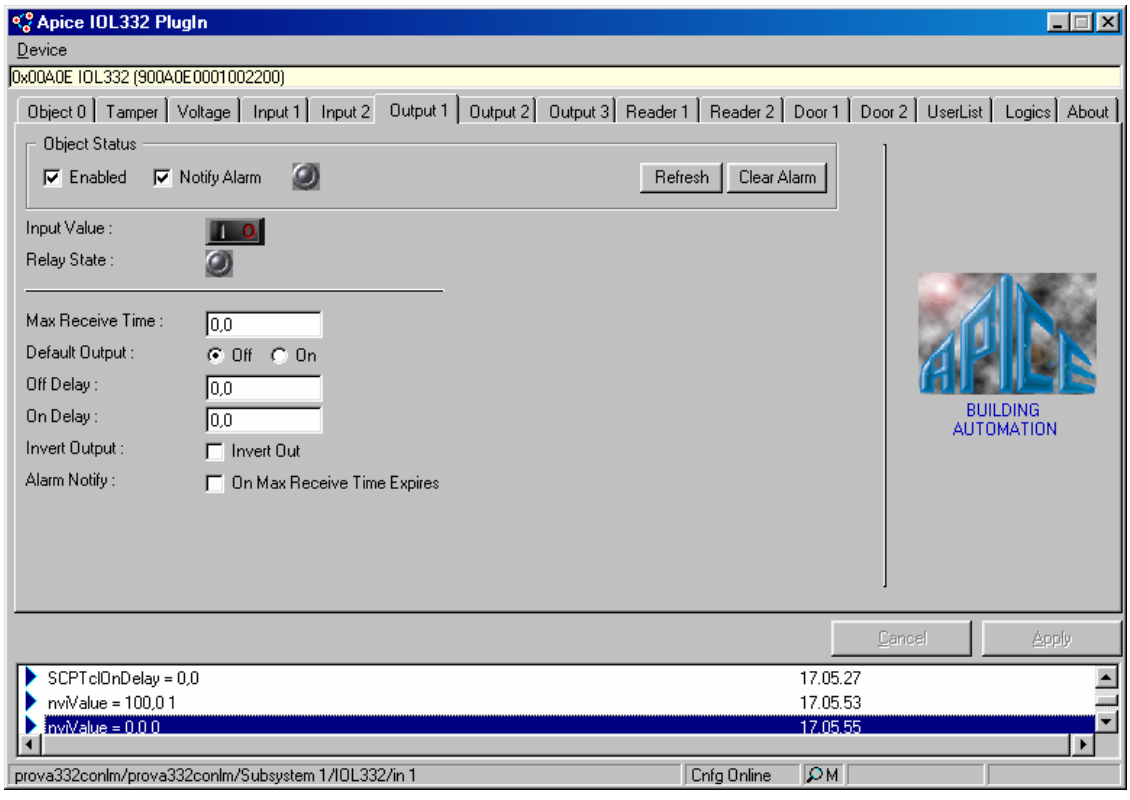
This network variable drives the relay state in according with **Invert Output** setting.

nvoValueFb

This *NV* reflect the real relay state. When the relay is ON, the *NV* is ON, when the relay is OFF the *NV* is OFF. Reverse mode doesn't affect this *NV*.

Configuring using plug-in:

The output setting window is showed below:



Input value

Clicking this switch to drive the input network variable *nviValue* for testing purpose.

- Position with red 0 = OFF
- Position with green 1 = ON

Relay state

This indicator, monitoring the *nvoValueFb NV*, shows the real relay state:

- Dark LED = OFF
- Green LED = ON

Max Receive time

This parameter correspond to *SCPTmaxRcvTime CP*. It works according with LONMARK® directives. When it has a value greater than 0, the object controls that at least one update in *nviValue* is received within the **Max Receive Time**. If no update are received within this time interval, the output will turn to the default value and one alarm could be sent out from the *nvoAlarm NV* in object 0.

Default output

This parameter correspond to *SCPTdefOutput CP*. This is the value assumed to the physical relay after a reset operation or in case of **Max Receive Time** failure.

Off Delay

This parameter correspond to *SCPTclOffDelay CP*. This is the delay between the *nviValue* goes to OFF value and the output relay turn to OFF.

On Delay

This parameter correspond to *SCPTclOnDelay CP*. This is the delay between the *nviValue* goes to ON value and the output relay turn to ON.

Invert output

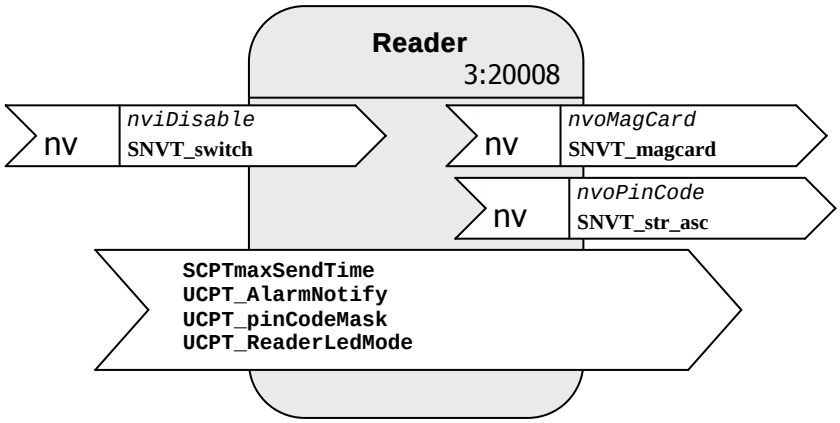
This parameter correspond to *SCPTinvrtOut*. It reverse the relation between the *nviValue* value and the real relay state, as showed in the table below:

nviValue	Invert Out = OFF	Invert Out = ON
OFF	OFF	ON
ON	ON	OFF

Alarm notify

When this box is checked, the **Max Receive Time** failure will send an alarm to the *nvoAlarm NV* in object 0.

5.7 Readers Objects



Each object controls a card reader input. Depending from the loaded application, *ISO clock+data* or *wiegand* interface can be used. The object drives up to 2 local indicator built in the reader in 3 different combinations: One LED, Two LED and LED + Buzzer.

nviDisable SNVT_switch

When this *NV* is ON, the reader will be disabled, when it is OFF the reader will properly work.

nvoMagCard

This *NV* sent out in **SNVT_magcard** format the value read from the card. Card reader input can work with *ISO clock+data* and *wiegand* input as explained in the first user manual session.

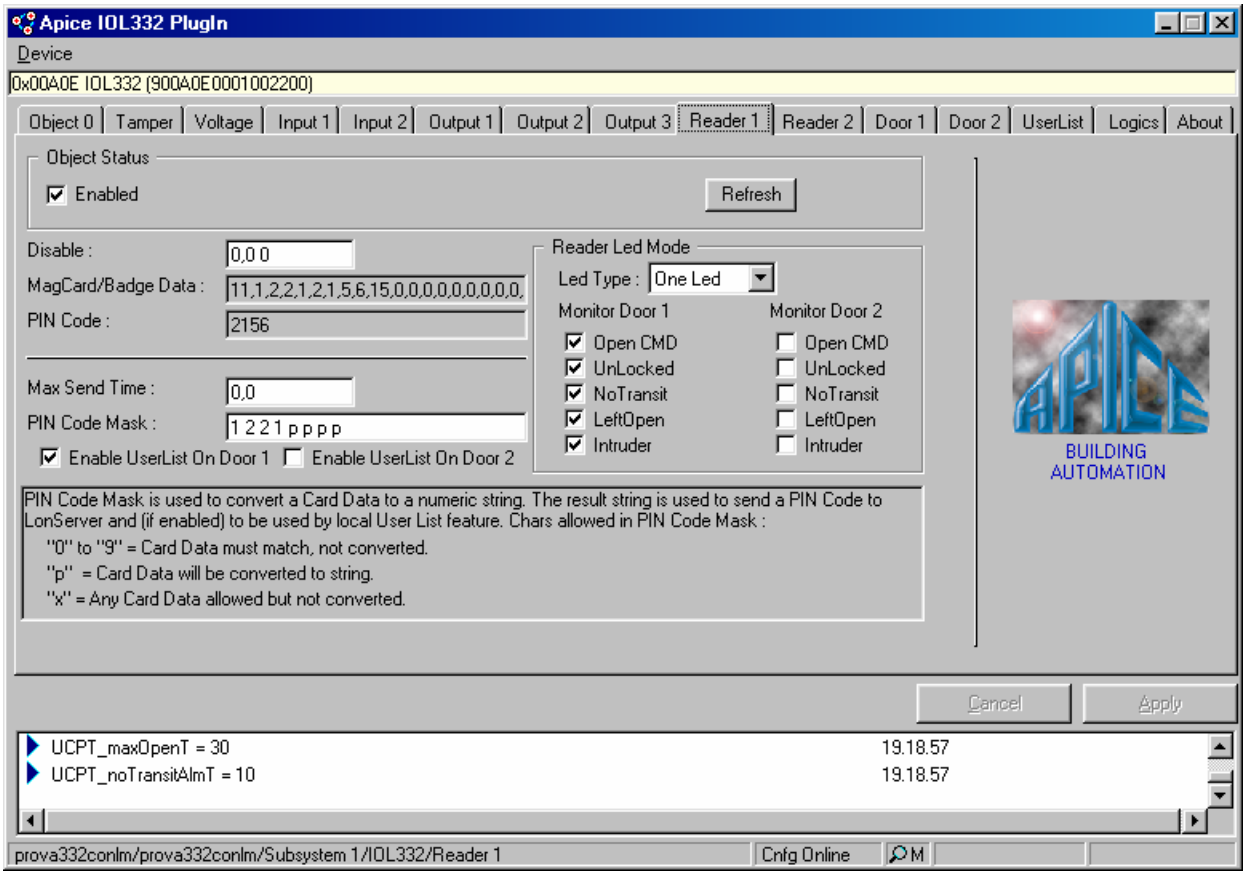
nvoPinCode

This variable has different mean, depend by the reader type.

1. If the reader isn't a PX10T: This *NV* sent out in **SNVT_str_asc** format a code conversion from card data present in *nvoMagcard*. This is used to interface the reader object with the pin code input in *LonServer*, especially when a keypad is used instead of a card reader. The code conversion mask must be set in *UCPT_PinCodeMask* as explained below.
2. If the reader is a PX10T: This *NV* sent out in **SNVT_str_asc** format the PIN that the user digit by the keyboard. To have the PIN code in this variable, the UCPT_PinCodeMask must be set in different mode, respect the previous case. This variable should contain a number of "t" as the PIN lenght, for example:
   - PIN=123: UCPT_PinCodeMask = ttt;
   - PIN=1234: UCPT_PinCodeMask = tttt;
   - PIN=12345: UCPT_PinCodeMask = ttttt;

Configuring using plug-in:

The reader configuration window is showed below:



Disable:

This switch allow you to test the disable input network variable behaviour. When the switch is ON, the reader is disabled, otherwise enabled.

Card Data

This read only field show the data read from the reader. Usually card data start with 11 value and end with 15 value.

PIN code:

This read only field show the numeric string obtained using PIN code mask conversion. This value is the same propagated to the output network variable *nvoPinCode*. The numeric value is used for local users list, too.

Max Send Time

Configuring this property with a value greater than 0, means the *nvoMagCard* will updated at least each **Max Send Time** sec. When an update will occur caused by **Max Send Time**, the *nvoMagCard* will contain all data field with value 0 to avoid conflict with an update caused by card read.
BE CAREFULL the *LonServer* or the access manager controller handles the **Max Send Time** from the reader, otherwise set it to 0 value.

PIN Code Mask:

This property must be configured in one of the followed cases:

- To treat card data as PIN code, especially when one keypad, with *ISO clock+data* or *wiegand* interface, is connected to a reader input.
- To use the internal users list.

The purpose of **PIN Code Mask** is to extract a numeric card code from the card data string. The mask work with the followed specify:

- A character between numeric **0..9** must match the card code but will be not extracted.
- The lower case character **p** is used in the position were we want to extract the card code.
- The lower case character **x** is used to indicate any character in card data, but it will be not extracted.
- Starting and ending character 11 and 15 are automatically skipped

Example:

Card data	11	1	2	2	1	2	1	5	6	15
Pin Code Mask		1	2	2	1	p	p	p	p	
PIN code						2	1	5	6	

Att! : This configuration is wrong if the reader is a PX10T, see above in nvoPinCode variable description.

Reader LED mode

The reader could have the followed local monitor devices:

- One green LED
- One green LED and one red LED or one two colors LED.
- One green LED and one Buzzer

We can select this configuration from the combo Box setting one of the related values:

- *One Led*
- *Two LED*
- *Led + Buzzer*

Then automatically the bad read and access not allowed events will be monitored.

The reader local monitor devices can also show the door status. Depending from binding and configuration, each reader could be used in conjunction with door 1 or door 2. For this reason we can select other monitor information coming from each door. Checking and un-checking the related box we can add or remove the door monitor condition:

- Open CMD: When the door receives an open command
- Unlocked: When the door is in unlock condition
- No transit: When the door generates a No Transit Alarm.
- Left open: When the door generates a Left Open Alarm.
- Intruder: When the door generates an Intruder Alarm.

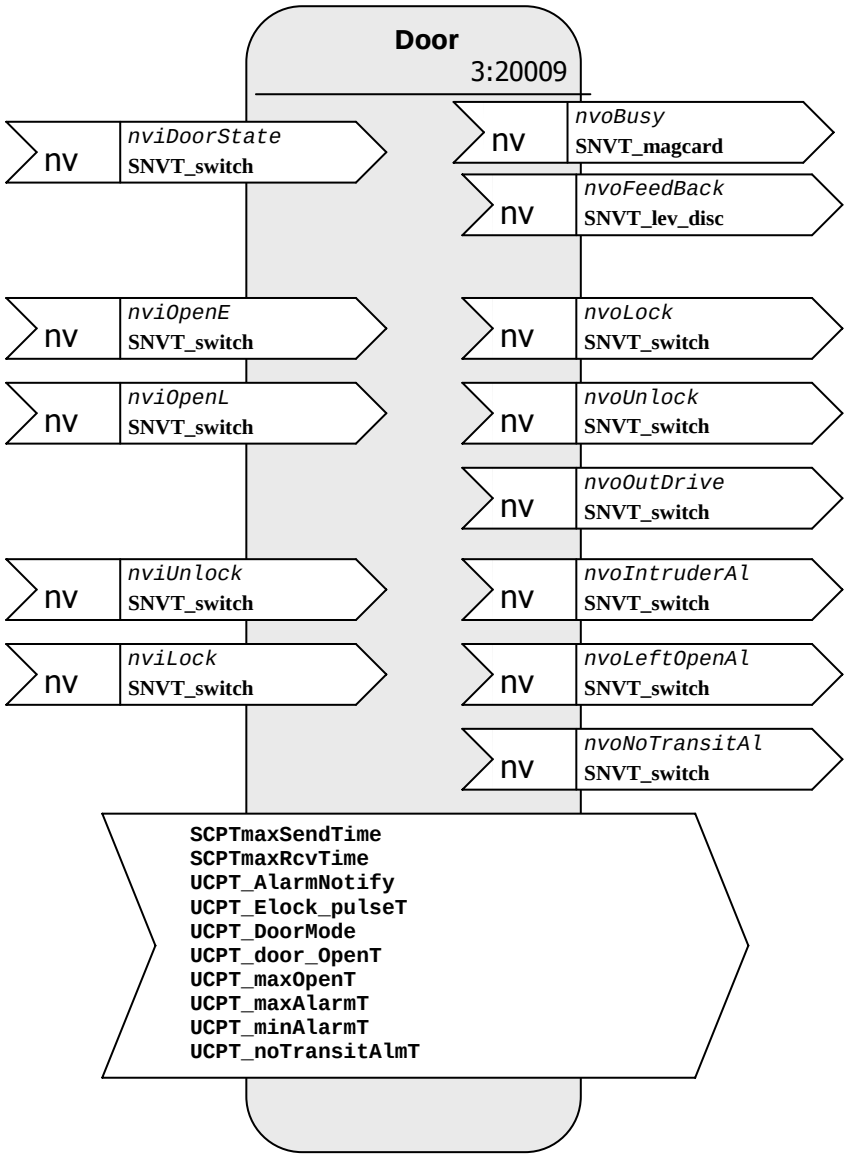
Please note the default value is all unchecked.

Hardware connection:

Green LED to LED1 output.
Red LED or buzzer to LED2 output.

Remark: an internal limitation resistor can be inserted in the output circuit in order to drive LED directly. See hardware session for more details.

5.8 Door Object



nviDoorState SNVT_Switch

To activate the door control feature, it is necessary bind to this *NVI* the value of the door status coming from an open loop sensor. Input 1 or Input 2 could be used for this purpose. An ON value in *NVI* means door closed, an OFF value means door open. This is to use normally closed switch (closed with door closed) without change the open loop sensor default behavior. To avoid debounce problem, **On Delay** and **Off Delay** could be set in open loop sensor object. A M**ax Receive Time** can be programmed for this *NVI*.

nviOpenE SNVT_Switch

This *NVI* is used to receive a single open door command. The command is performed only when the *NVI* is updated to ON value. The *NVI* level is ignored, it could remains indefinitely to ON value without affect the object behavior. Also the OFF updates are ignored. This *NVI* is used normally to receive the open command from an access manager controller and/or a manual pushbutton. When an open command is processed, the *nvoOutDrive NV* is updated to ON value and it will return OFF when the *electric lock pulse time* is expired. If the *electric lock pulse time* is programmed to value 0, the *nvoOutDrive* remains ON during the time programmed in *the door must be opened within xxx sec* parameter in plug-in, but in this case it is necessary to have the door state control. In this case, the *nvoOutDrive* stay ON whit the opened door.

nviOpenL SNVT_Switch

This *NVI* performs the same functionality of *nviOpenE* with the difference that the *nvoOutDrive* remains ON until the *nviOpenL* remains to ON value, but not less than the minimum electric lock programmed time. The door alarm will be not disabled.

nviUnlock SNVT_Switch

To switch the door object in unlock state, this *NVI* must be driven to the ON value. In unlock state the door alarms are inhibited and the *nvoOutDrive* can be affected in 3 different ways, depending from the setting (see in configuration session for more details).

nviLock SNVT_Switch

To put the door object in Lock state, this *NVI* must be driven to ON value. In Lock state the *nvoOutDrive* will be never drive to ON value.

nvoBusy SNVT_Switch

This *NVO* is used only when is used the door state input. It assume the ON value during the door opening cycle. The *nvoBusy* behavior can be observed in the plug-in.

nvoFeedBack SNVT_Switch

This *NVO* is only used to send the door information to APICE *LonServer* device, when we are interesting to log in event memory the door state and alarms. If the door state is not used, it is not necessary to bind this *NVO* to *LonServer* and in this case set the *LonServer gateEvLog* configuration property must be set to 0, to disable the gate event recording.

nvoLock SNVT_Switch

This *NVO* reflect the object lock status. When the door is locked, this *NVO* assume the ON value.

nvoUnlock SNVT_Switch

This *NVO* reflect the object unlock status. When the door is unlocked, this *NVO* assume the ON value.

nvoOutDrive SNVT_Switch

This is the *NVO* which drive the electric lock output. It must be bound to an open or close loop actuator. One of the three relay outputs could be used for this purpose. A **Max Send Time** can be programmed for this *NVO*.

nvoIntruderAl SNVT_Switch

This *NVO* goes to ON value when the door is open without a preventive open command. The *NVO* stay to ON value at least the *minimum intruder and left open alarm time* and return to OFF when the door is closed or the *maximum intruder and left open alarm time* is expired. Programming the max time to 0 means the *NVO* will turn OFF only when the door will be closed.

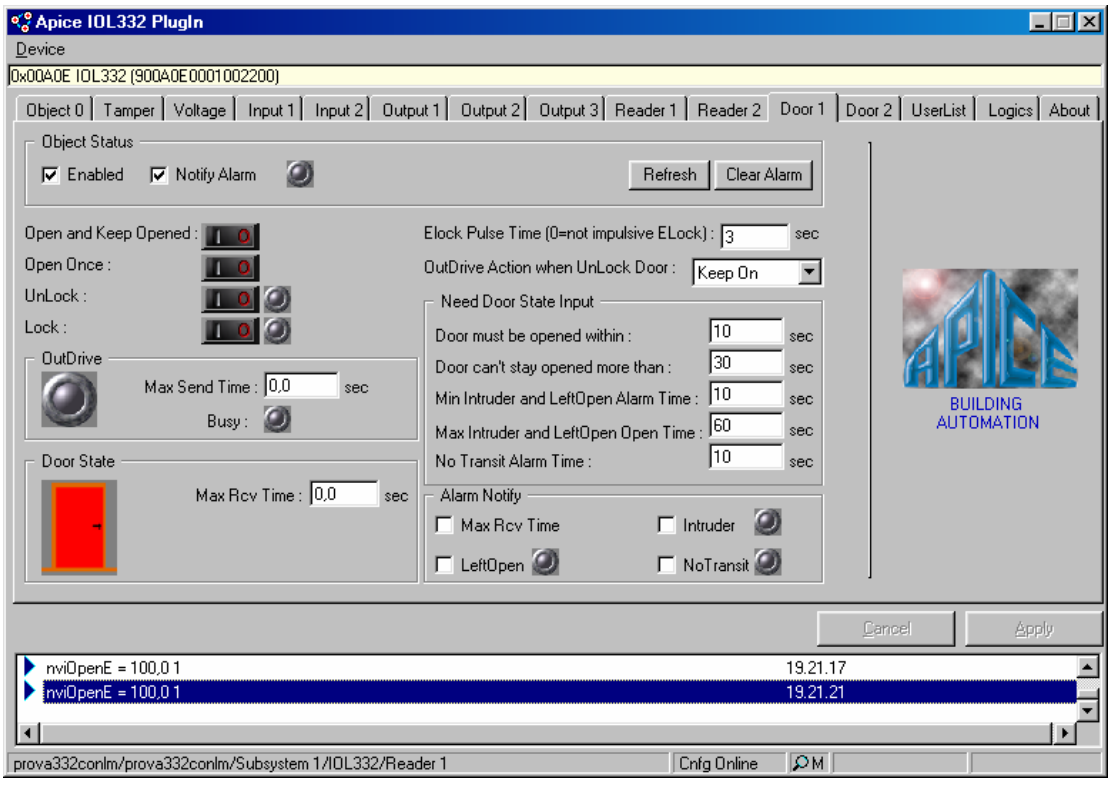
nvoLeftOpenAl SNVT_Switch

This *NVO* goes to ON value when the doors remains open more than the time programmed in *the door cannot stay opened more than xxx sec*. The *NVO* stay to ON value at least the *minimum intruder and left open alarm time* and return to OFF when the door is closed or the *maximum intruder and left open alarm time* is expired. Programming this time to 0 means the *NVO* will turn OFF only when the door will be closed.

nvoNoTransitAl SNVT_Switch

This *NVO* goes to ON value when, after a door open command, the door is not open within the time programmed in *the door must be opened within xxx sec* parameter. This *NVO* will stay to ON value the time programmed in *Not transit alarm time* parameter.

Configuration using plug-in:



Open and keep opened:

This switch drive the *nviOpenL NV*.

Open Once:

This switch send an ON update to *nviOpenE NV*. The switch will return automatically to OFF position

Unlock:

This switch drive the *nviUnlock NV*. The indicator in the right show the *nvoUnlock* value.

Lock:

This switch drive the *nviLock NV*. The indicator in the right show the *nvoLock* value.

Out Drive:

This indicator show the *nvoOutDrive NV* value. This is the *NV* suitable to drive the electric lock. When an input door state is bound to the object, the busy indicator will show the *nvoBusy NV* value. It is possible to program a **Max Send Time** to *nvoOutDrive NV*. Remember to execute a node reset after programming the **Max Receive Time**.

Door state:

This icon showing an opened and a closed door show the door state. If the *nviDoorState NV* is not bounded, this indication could be ignored. A **Max Receive Time** can be set to *nviDoorState NV*. When the **Max Receive Time** fails, an alarm will be generated to the *nvoAlarm NV* in object 0.

Elock pulse time (0 = not impulsive elock):

This is the electric lock pulse time. Only integer values are allowed. It is possible to program 0 in this field, but in this case the door state must be used. This is to use electric lock which need to be driven when the door is open too. In this case, after receiving an open command, the *nvoOutDrive* will stay ON during the time programmed in *Door must be opened within xxx sec* parameter, when the door is not opened.

OutDrive action when unlock the door:

This parameter define the electric lock behavior when the door goes in the Unlock state. One of these tree different mode can be set:

- *No effect:* The electric lock will be not affected
- *Give one pulse:* When goes in Unlock state, a single open command will be sent to the electric lock.
- *Keep on:* The electric lock will stay on during as long the door unlock state.

Door must be opened within xxx sec

If the door is not opened within this time, a No transit alarm will generate. If the electric lock pulse time is set to 0, this is the duration of the electric lock pulse when the door is not opened.

Min Intruder and Left Open alarm:

This is the intruder and left open alarm minimum time duration.

Max Intruder and Left Open alarm:

Intruder and left open Alarm stay active until the door remains open and not less than minimum time. If the door will be not closed, it is possible to program a maximum alarm time in this parameter. If this parameter is set with 0 value, the intruder and/or left open alarm will be reset only when the door will be closed.

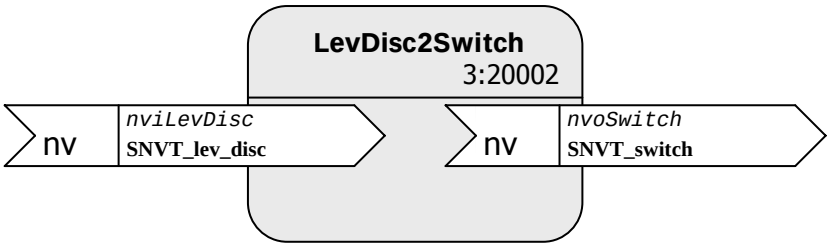
No transit alarm time:

This is the no transit alarm time duration.

Alarm notify:

This is to program which alarm will be sent in the *nvoAlarm NV* in object 0.

5.9 SNVT_lev_disc to SNVT_switch CONVERTER OBJECTS



IOL332 includes two objects to easily convert a **SNVT_lev_disc** *NV* to a **SNVT_switch** *NV*.

nviLevDisc SNVT_levDisc

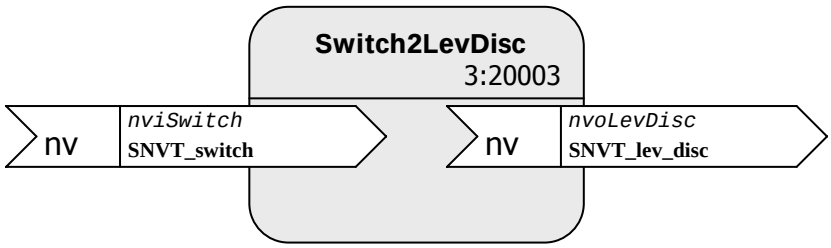
This is the input to receive a **SNVT_lev_disc** *NV*. The value **ST_OFF** will be interpreted as OFF value, all the others values as ON value.

nvoSwitch SNVT_switch

This is the **SNVT_switch** output variable converted as explain in the **SNVT_switch** convention in this manual (pag. 16).

This object has not configuration property to be programmed using plug-in.

5.10 SNVT_switch to SNVT_lev_disc CONVERTER OBJECTS



IOL332 contains two objects convert a **SNVT_switch** *NV* to a **SNVT_lev_disc** *NV*.

nviSwitch SNVT_switch

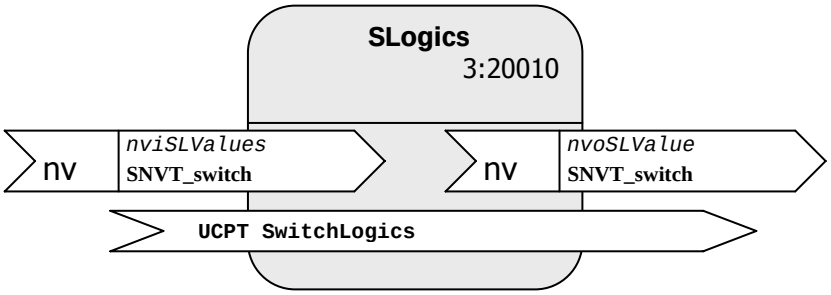
This is the input to receive a **SNVT_switch** *NV*. Values ON and OFF are interpreted as explained in SNVT_switch convention in this manual (pag. 16).

nvoLevDisc SNVT_lev_disc

This is the **SNVT_lev_disc** output variable. An input OFF value will be converted in ST_OFF output value, an ON input value in ST_ON output value.

This object has not configuration property to be programmed using plug-in.

5.11 Logic Function Object



This object allow to perform logical operation up to 63 **SNVT_switch** output network variables. The output network variables must be bound to *nviSLValues* and the *nvoSLValue* will output the logical operation requested between all bounded output network variables.

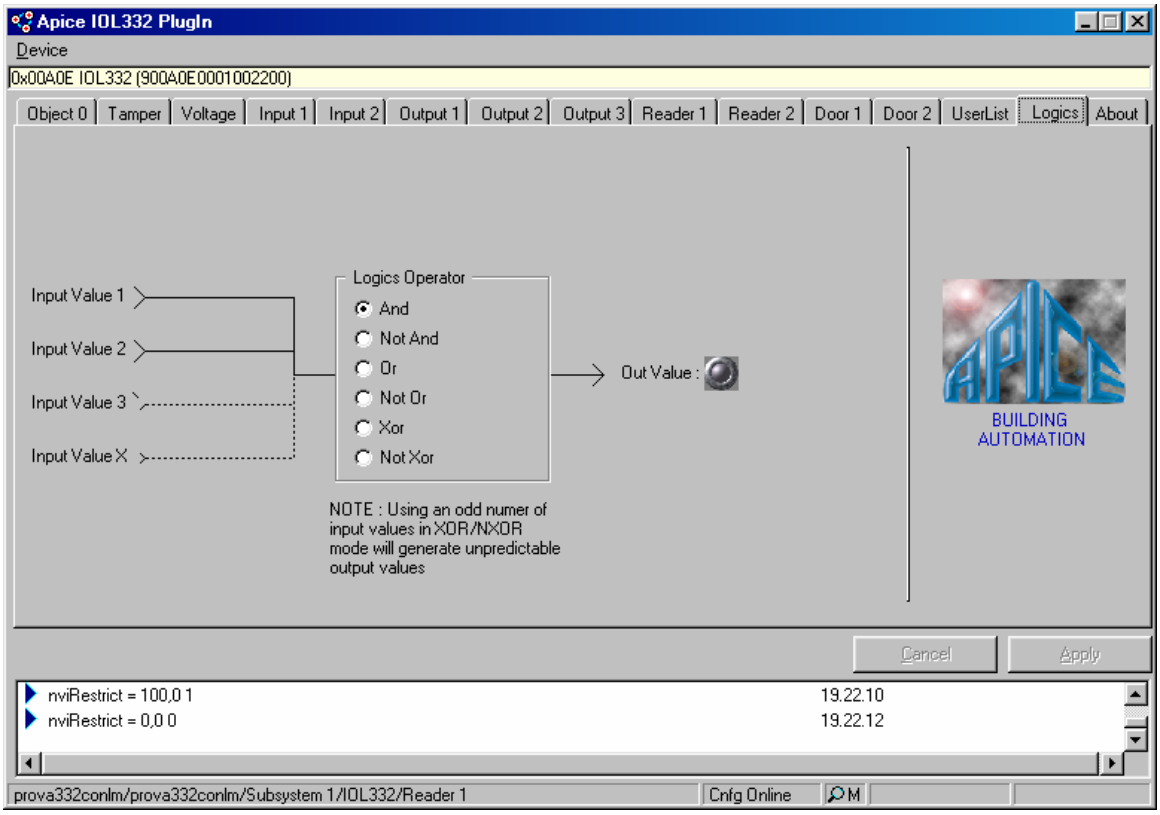
nviSLValues SNVT_switch

Accept multiple output network variables to perform a logical operation.

nvoSLValue SNVT_switch

Result of the logical operation. Each time the object receive a network variable update, it will perform (if it is necessary) a poll operation in *nviSLValues* to determine the result.

Configuring using plug-in:



Logic operator:

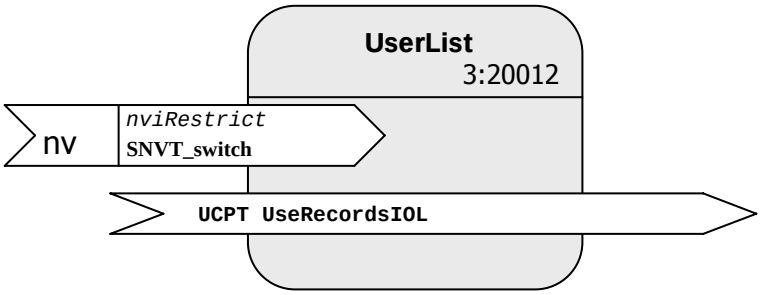
And: All *NV* must have ON value to obtain output ON value, otherwise OFF.
Not and: All *NV* must have ON value to obtain output OFF value, otherwise ON.
Or: All *NV* must have OFF value to obtain output OFF value, otherwise ON.
Not Or: All *NV* must have OFF value to obtain output ON value, otherwise OFF.
Xor: All *NV* must have similar value to obtain OFF value, otherwise ON.
Not xor: All *NV* must have similar value to obtain ON value, otherwise OFF.

Remark: Don't use the XOR or NOT XOR functionality when an even number of output network variables are bounded to *nviSLValues*.

Out value:

This indicator show the output value result.

5.12 User List Object



This object contains the local users list. The local users list can manage up to 100 card codes with 4 special flags as explained in configuration detail. Users list is used when:

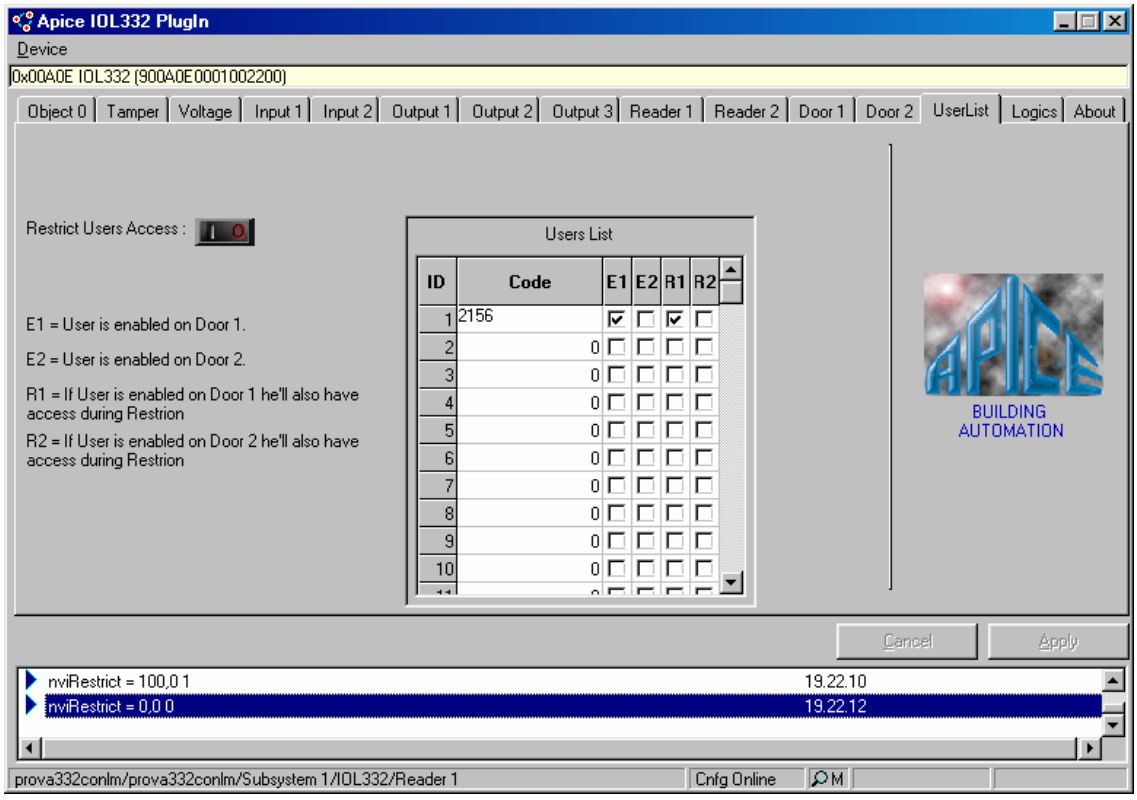
- The Enable user list box is checked in the reader object configuration.
- The reader object cannot receive acknowledge from *LonServer*

To use the local users list, the card code must be converted to a numeric string, using the pin code mask, as explained in the reader configuration setting.

nviRestrict SNVT_switch

When this *NVI* is set to ON value, the restrict access mode is enabled and only the users with the restrict flag marked could gain the access.

Configuring using plug-in:



Restrict users access:

This switch allow to simulate ON and OFF value to *nviRestrict NV*.

Users list:

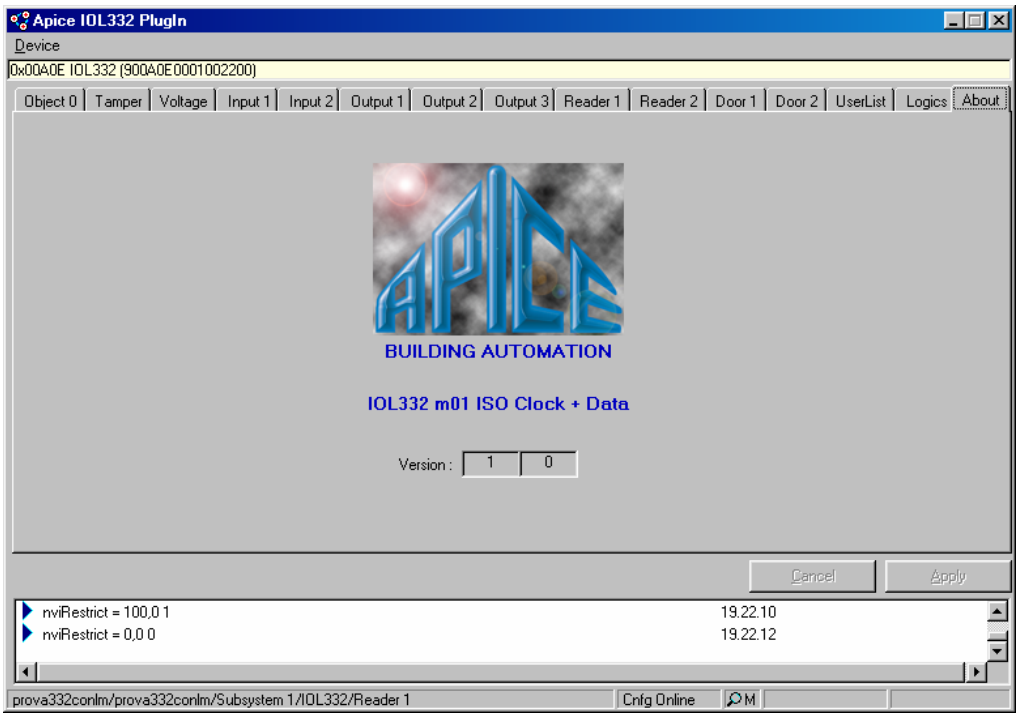
This is the 100 position users code list. In the first cell the card code must be programmed. The card code is obtained from the reader using the PinCodeMask conversion, when the card code doesn't match any code in the users list, the card code will be not valid. There are other 4 flags to complete the code enabling:

E1 = when checked the user can access from the reader 1
E2 = when checked the user can access from the reader 2
R1 = when checked the user can access from the reader 1 in restrict mode too (E1 also checked)
R2 = when checked the user can access from the reader 2 in restrict mode too (E2 also checked)

Both E1 and E2 unchecked means the code is disabled because the access is not allowed in any readers.

6. ABOUT WINDOW

This is the about window in the plug-in

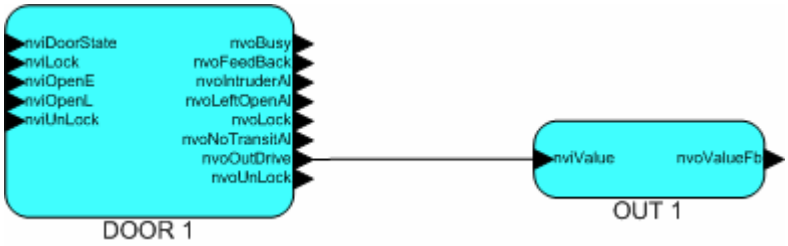


This is the about window, useful to discovery the application release running in the IOL332. Application can be easily updated thought the LonWorks® Network.

7. APPENDIX

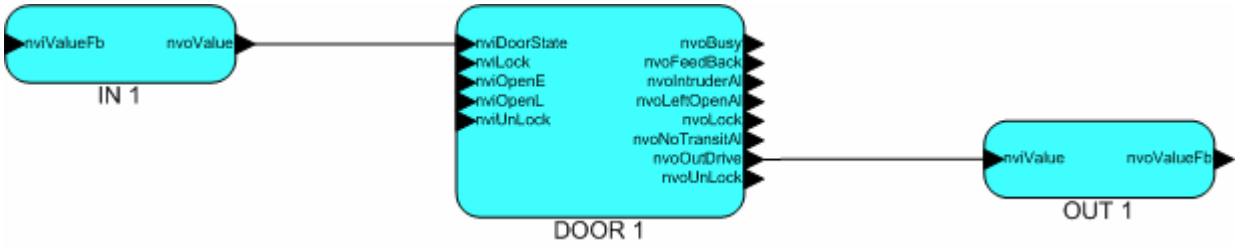
A. DOOR OBJECT

The door object need at least the binding between the *nvoOutDrive NV* and one actuator, to be able to give a physical output in order to power up the electric lock or the gate automatism.



The door object send always ON value to give the open command to the output object. Programming the output object *CP* is possible to reverse the operating mode between the security fail (the default) to safe fail. In security fail the output relay is normally OFF. In case of power failure the door will remain close. In safe fail the output relay will be normally ON to keep the door close and when there is a power supply failure the relay will turn OFF opening the gate. To work in safe fail mode, in the output object must be programmed the **Invert Out** parameter to ON. When the output object is contained in another physical node than door object, we advise to program the **Max Send Time** parameter in door object and **Max Receive Time** in output object, configuring the default output to the desiderate value, too.

In the binding showed above, the door object doesn't control any door state and it will not generate any alarm. Installing a door switch (usually a magnetic switch) to sense the door status, we can use the door object full feature. The door switch will be connected to a physical input, then bind to *nviDoorState* as the followed picture shows:

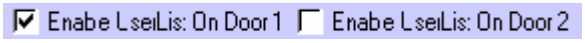


The door object will automatically detect the binding. In this case the full door object feature can be used as the door alarms. The door object accept in *nviDoorState* OFF value as door opened and ON value as door closed. This is to use the input object in the default configuration. In fact usually the magnetic switch is closed whit the door closed. We advise to program a minimal On delay and Off delay time in the input object to avoid fake alarm in case of switch debouncing. A **Max Receive Time** related to *nviDoorState* can be

programmed. In case of failure an alarm will be send thought the *nvoAlarm NV* in object 0.

B. USE OF IOL332 WITHOUT EXTERNAL DATABASE MANAGER (LONSERVER)

After binding and configuring the door objects as explained in the previous page, the IOL332 don't need other binding to work using only the local users list. It is enough to program the readers object *CP* and the users list, just using the plug-in. Each physical reader can be programmed to open one door, checking the related box in the plug-in reader window.



When one reader has been set to open one door, as in the example door 1, it is necessary to create one opportune PIN code mask in order to extract a numeric code from the card code, as explained in the present user manual at pag. 29. Each time one card run in the reader, a card code will be read and consequently a numeric code will extract. To have the authorized access, the code will match one in the users list and the opportune access right specified with the flags E1, E2, R1, R4 will be comply as explain in the chapter

5. (pag. 38).

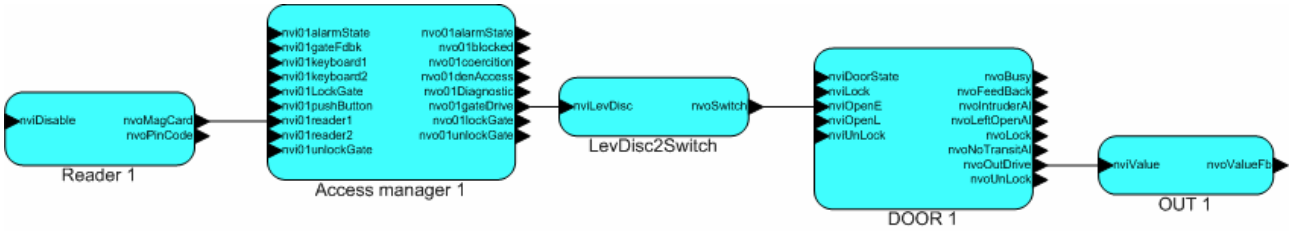
If the card has the right to access, an opening cycle is performed by the door object and through *nvoOutDrive NV* the electric lock will be driven.

The door object will be used with or without the door state control, indifferently, like explained in the previous page.

C. USE OF IOL332 WITH EXTERNAL DATABASE MANAGER (*LONSERVER*)

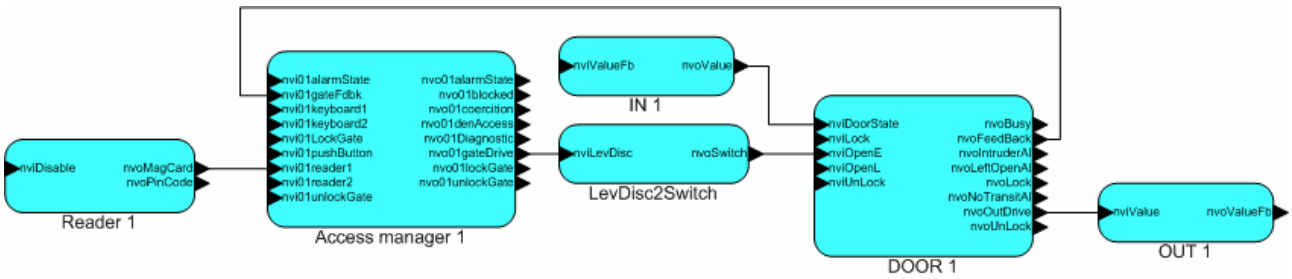
IOL332 can be easily interfaced with an external database manager controller working on the LONWORKS® network. APICE *LonServer* product is suitable to control up to 8 door, where two card readers + two keyboards can be managed for each door to gain the access right. In the followed examples we assume to use the current *LonServer* version using **SNVT_lev_disc** *NV* to handle ON/OFF value but the IOL332 is using for the same purpose the **SNVT_switch** *NV* type. This type conflict because LONMARK® association has declared obsolete the type **SNVT_lev_disc** and the APICE new product don't use this *NV* type. In the next future a new *LonServer* version using SNVT-switch *NV* type instead of **SNVT_lev_disc** will be available. Tanks to the converter objects contains in IOL332 will be always possible to use the product with old *LonServer* version, too.

D. SAMPLE 1: DOOR WITH ONE READER, WITHOUT DOOR STATE CONTROL



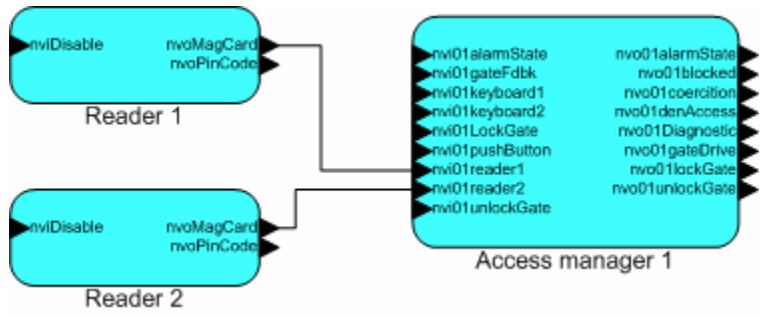
The reader object in IOL332, send data to the nvi01reader1 *NV* in *LonServer* Access manager 1 object. If the code is valid the nvo01GateDrive *NV* will send the opening command to the *nviOpenE NV* in door 1 object in IOL332, using in this case a LevDisc2Switch converter. Finally the *nvoOutDrive* will send the opening command to the relay output OUT 1. Remember to disable in *LonServer* the gate event recording in this case.

E. SAMPLE 2: DOOR WITH ONE READER WITH DOOR STATE CONTROL



The door state input is bound to door 1 object. The *LonServer* can store the gate event using the binding *nvoFeedBack* with nvi01gateFdbk. The rest is working like the previous example.

F. SAMPLE 3: USING TWO READERS

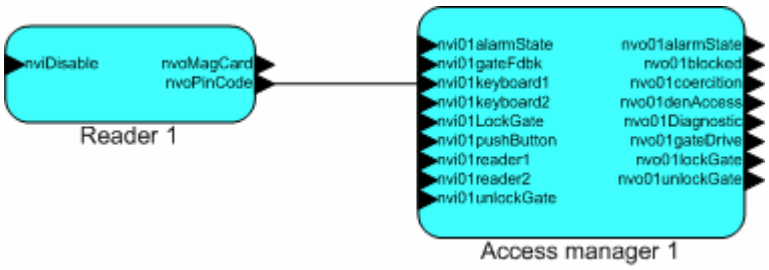


In this example we are omitting the door object driving because it works always as explained in the two previous examples. One reader can be installed in each door side and in this case it is enough to bind the two readers object in IOL332 to the same access manager. To avoid conflict with LED indicator in the reader when the card is not valid, bound always the reader 1 with the *nviXXreader1* and reader 2 with *nviXXreader2*. Use also the convention to assign to the reader 1 the

entrance side and the reader 2 in exit side refer to the security area. For example the outdoor reader will be the reader 1.

G. SAMPLE 4: USING PIN IDENTIFICATION

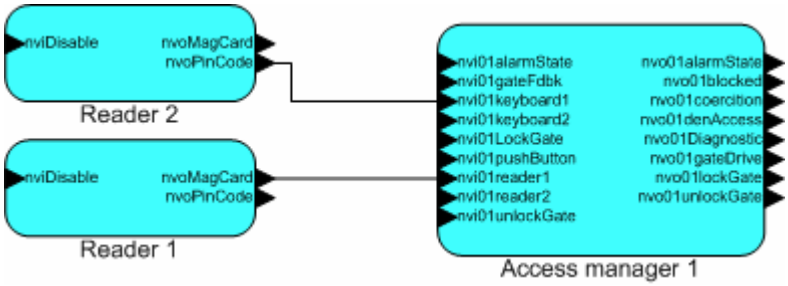
IOL332 is suitable to interface digital keypad instead of card reader. This kind of device, which APICE propose in its catalogue too, send out in *ISO clock+data* or in *wiegand* format the code type in the keyboard. In this case a typed code could be interpreted like a 'card code' without require any special feature in the reader controller (the IOL222 product is suitable to do this too). The new feature introduced in IOL332 allow to treat the typed code like a real PIN code and not like a card code. To do this, it is necessary to compose one opportune PIN mask in the reader object configuration (see pag. 29) and bind the *nvoPinCode NV* to *nviXXKeyboard* like in the followed picture.



The difference is the PIN code is treat as identification level 1 instead of 2 (card code) and the PIN code programmed in AxWin access control software will be comply wit the typed code in the keyboard.

H. SAMPLE 5: USING CARD + PIN IDENTIFICATION

To obtain CARD + PIN identification, it is possible to use the APICE JLON identification terminal or use one keyboard as described above in conjunction with one reader. In this case, we need to use both reader inputs in IOL332. As show in the picture we could connect the reader to the reader 1 input and bind the *nvoMagcard* to *nviXXreader1* in access manager and the keyboard to the reader 2 input, programming PIN Mask and binding the *nvoPinCode* to *nviXXKeyboard1*.



The Equipment is complied with European Specification

CE

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